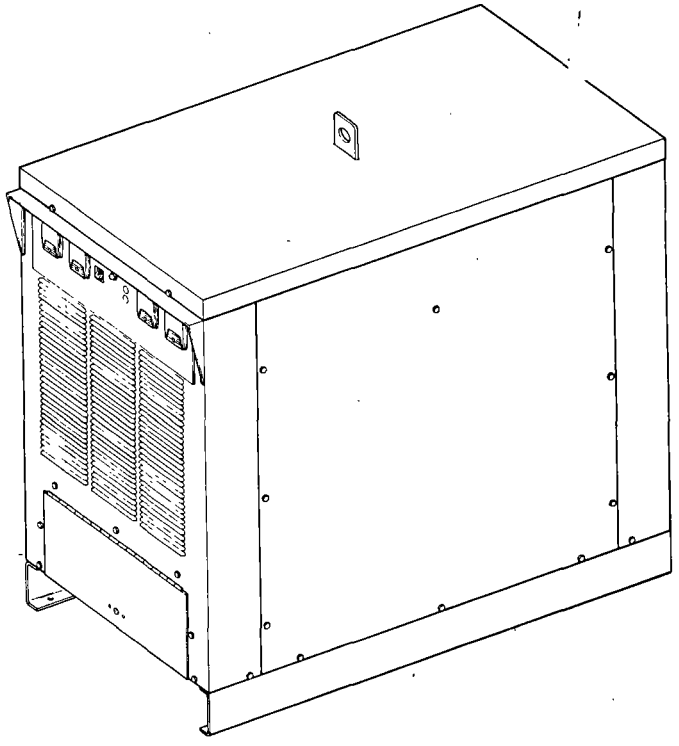
January 1989 FORM: OM-267F

Effective With Serial No. JJ415979

Miller®

MODEL

GPS-1000
GPS-1500A
GPS-1500V



OWNER'S MANUAL

IMPORTANT: **Read and understand the entire contents of this manual, with *special emphasis on the safety material* throughout the manual, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.**

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A Miller Group Ltd. Company

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PRINTED IN U.S.A.

ADDITIONAL COPY PRICE 80 CENTS

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EFFECTIVE: FEBRUARY 16, 1988

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3. Original main power rectifiers ..... 3 years (labor – 1 year only)
4. All welding guns, feeder/guns and torches .... 90 days
5. All other Millermatic Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor 60 days
7. Batteries ..... 6 months

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July 11, 1989 FORM: OM-267F

ERRATA SHEET

After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.

AMENDMENT TO SECTION 8 – PARTS LIST

Amend Parts List as follows:

**	Dia. Mkgs.	Part No.	Replaced With	Description	Quantity Model 1000	1500A	1500V
29-	TE2	038 621	Deleted	1000A Model only (Eff w/JK638859)			
29-		092 301	130 165	COIL, pri/sec 230/460 (Eff w/JK642601)		6	
29-		092 300	130 162	COIL, pri/sec 230/460/575 (Eff w/JK642601)		6	
29-		092 295	130 164	COIL, pri/sec 460 (Eff w/JK642601)			6

**First digit represents page no - digits following dash represent item no.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

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SECTION 1 - SAFETY RULES FOR OPERATION OF ARC WELDING POWER SOURCE
SECTION 1 - RÈGLES DE SÉCURITÉ POUR LE FONCTIONNEMENT DU POSTE DE SOUDAGE À L'ARC

1-1. INTRODUCTION - We learn by experience. Learning safety through personal experience, like a child touching a hot stove is harmful, wasteful, and unwise. Let the experience of others teach you.

Safe practices developed from experience in the use of welding and cutting are described in this manual. Research, development, and field experience have evolved reliable equipment and safe installation, operation, and servicing practices. Accidents occur when equipment is improperly used or maintained. The reason for the safe practices may not always be given. Some are based on common sense, others may require technical volumes to explain. It is wiser to follow the rules.

Read and understand these safe practices before attempting to install, operate, or service the equipment. Comply with these procedures as applicable to the particular equipment used and their instruction manuals, for personal safety and for the safety of others.

Failure to observe these safe practices may cause serious injury or death. When safety becomes a habit, the equipment can be used with confidence.

These safe practices are divided into two Sections: 1 - General Precautions, common to arc welding and cutting; and 2 - Arc Welding (and Cutting) (only).

Reference standards: Published Standards on safety are also available for additional and more complete procedures than those given in this manual. They are listed in the Standards Index in this manual. ANSI Z49.1 is the most complete.

The National Electrical Code, Occupational Safety and Health Administration, local industrial codes, and local inspection requirements also provide a basis for equipment installation, use, and service.

1-2. GENERAL PRECAUTIONS

Different arc welding processes, electrode alloys, and fluxes can produce different fumes, gases, and radiation levels. In addition to the information in this manual, be sure to consult flux and electrode manufacturers for specific technical data and precautionary measures concerning their material.

A. Burn Prevention

Wear protective clothing - gauntlet gloves designed for use in welding, hat, and high safety-toe shoes. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Wear helmet with safety goggles or glasses with side shields underneath, appropriate filter lenses or plates (protected by clear cover glass). This is a MUST for welding or cutting, (and chipping) to protect the eyes

1-1. INTRODUCTION - Contrairement à l'apprentissage de la vie, l'apprentissage de la sécurité par expérience personnelle, comme l'enfant qui touche un poêle chaud, est dangereux, imprudent et inutile. Instruisez-vous donc de l'expérience d'autrui.

Des méthodes de sécurité issues de l'expérience du soudage et du coupage sont décrites dans le manuel. La recherche, le progrès et l'expérience dans ce domaine ont développé un matériel fiable et des méthodes de sécurité pour l'installation, le fonctionnement et l'entretien. Des accidents se produisent lorsque le matériel est inadéquatement utilisé ou entretenu. La raison de ces méthodes de sécurité peut ne pas être toujours donnée. Certaines sont fondées sur le sens commun, d'autres demanderont à être expliquées par des livres techniques. Il est plus sage de suivre les règles.

Lisez et comprenez ces méthodes de sécurité avant d'essayer d'installer, de faire fonctionner ou de réparer l'appareil. Pour votre sécurité personnelle et celle d'autrui, conformez-vous à ces règles et aux manuels d'instructions.

Manquer d'observer ces méthodes de sécurité pourrait entrainer des blessures graves ou même la mort. Quand la sécurité devient une habitude, le matériel peut alors être utilisé en toute confiance.

Ces méthodes de sécurité sont divisées en deux sections: 1 - Précautions générales, communes au soudage et au coupage à l'arc, et 2 - Soudage à l'arc (et coupage) (uniquement).

Normes de référence: Des publications des normes américaines de sécurité sont aussi à votre disposition pour d'autres modes opératoires plus complets que ceux du présent manuel. Elles sont données dans l'Index des Normes de ces règles de sécurité. ANSI Z49-1 est la plus complète.

Les codes de l'ACNOR, les codes provinciaux et municipaux donnent aussi les exigences pour une installation, une utilisation et un entretien sûrs.

1-2. PRÉCAUTIONS GÉNÉRALES

Plusieurs procédés du soudage à l'arc, des électrodes alliés, et les flux peuvent produire des vapeurs, gaz, et niveaux de rayonnement différents. Pour tout renseignement supplémentaire à ce manuel, consultez aussi les fabricants des électrodes et des flux afin d'obtenir les renseignements techniques spécifiques et les mesures de précaution concernant leurs matériaux.

A. Prévention des brûlures

Portez des vêtements de protection - des gants à crispin spécialement désignés pour le soudage, un casque et des chaussures de sécurité. Boutonnez le col de votre chemise et les pattes de vos poches, et portez des pantalons sans revers pour éviter que des étincelles et du laitier ne s'y introduisent.

Portez un masque avec lunettes de sécurité ou avec écrans laté-raux de protection, des lunettes filtrantes ou des couvre-lentilles (protégés par un verre clair). Pour le soudage ou le coupage (et le burinage), il est

from radiant energy and flying metal. Replace cover glass when broken, pitted, or spattered. See 1-3A.2.

Avoid oily or greasy clothing. A spark may ignite them.

Hot metal such as electrode stubs and workpieces should never be handled without gloves.

Medical first aid and eye treatment. First aid facilities and a qualified first aid person should be available for each shift unless medical facilities are close by for immediate treatment of flash burns of the eyes and skin burns.

Ear plugs should be worn when working on overhead or in a confined space. A hard hat should be worn when others work overhead.

Flammable hair preparations should not be used by persons intending to weld or cut.

B. Toxic Fume Prevention

Severe discomfort, illness or death can result from fumes, vapors, heat, or oxygen enrichment or depletion that welding (or cutting) may produce. Prevent them with adequate ventilation as described in ANSI Standard Z49.1 listed 1 in Standards index. NEVER ventilate with oxygen.

Lead -, cadmium -, zinc -, mercury -, and beryllium - bearing and similar materials, when welded (or cut) may produce harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used, or each person in the area as well as the operator must wear an air-supplied respirator. For beryllium, both must be used.

Metals coated with or containing materials that emit toxic fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator.

Work in a confined space only while it is being ventilated and, if necessary, while wearing an air-supplied respirator.

Gas leaks in a confined space should be avoided. Leaked gas in large quantities can change oxygen concentration dangerously. Do not bring gas cylinders into a confined space.

Leaving confined space, shut OFF gas supply at source to prevent possible accumulation of gases in the space if downstream valves have been accidently opened or left open. Check to be sure that the space is safe before re-entering it.

Vapors from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and other lung and eye irritating products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapors to form phosgene. DO NOT WELD or cut where solvent vapors can be drawn into the welding or cutting atmosphere or where the radiant

OBLIGATOIRE de protéger ses yeux contre l'énergie de rayonnement et les éclats de métal. Remplacez le verre protecteur lorsqu'il est brisé, piqué ou qu'il a reçu des projections. Voir 1.3A.2.

Évitez de porter des habits imprégnés d'huile ou de graisse. Une étincelle pourrait les enflammer.

Ne manipulez jamais sans gants un métal chaud tel que des chutes d'électrode et des pièces à souder.

Premiers soins et traitement des yeux: Tout atelier devrait avoir à sa disposition un poste de premiers soins ainsi qu'une personne compétente, à moins qu'ur, service médical ne soit à proximité pour soigner immédiatement les brûlures des yeux et de la peau.

Portez des bouche-oreilles lorsque vous travaillez au plafond ou dans un espace restreint. Portez un casque lorsque d'autres personnes travaillent au plafond.

Les personnes devant souder ou couper ne doivent pas employer des préparations inflammables pour leurs cheveux.

B. Prévention des gax toxiques

Les gaz, les vapeurs, la chaleur, un enrichissement ou un manque d'oxygène peuvent entraîner un malaise, une maladie ou même la mort. Remédiez-y par la ventilation décrite dans la Norme ANSI Z49.1 paragraphe 1 de l'Index des Normes. NE ventilez JAMAIS à l'oxygène.

En soudant ou en coupant, les plomb, cadmium, zinc, mercure et béryllium ou autres matériaux semblables peuvent créer des concentrations nocives de gaz toxiques. On doit avoir recours à une ventilation aspirante adéquate du local, ou alors toute personne sur les lieux, de même que le soudeur, doit porter un masque à adduction d'air. On doit employer les deux pour le béryllium.

Les métaux enrobés ou composés de matériaux émettant des gaz toxiques ne doivent pas être chauffés à moins que l'enrobage ne soit ôté de la surface à travailler, que le local ne soit bien ventilé, ou que le soudeur ne porte un masque à adduction d'air.

Ne travaillez dans un espace restreint que s'il est bien ventilé et, si nécessaire, portez un masque à adduction d'air.

On doit éviter les fuites de gaz dans un espace restreint. Les fuites de gaz en grande quantité peuvent transformer dangereusement la concentration d'oxygène. N'amenez pas de bouteilles de gaz dans un espace restreint.

En quittant un espace restreint, FERMEZ le robinet d'alimentation de gaz de la bouteille. Ainsi on pourra rentrer en toute sécurité dans la pièce, même si les robinets "aval" ont été ouverts par accident, ou si on les a laissés ouverts.

Les vapeurs de dissolvants chlorés peuvent être décomposées par la chaleur de l'arc (ou de la flamme) et former du PHOSGÈNE, gaz très toxique, et d'autres produits irritant les poumons et les yeux. L'énergie ultra-violette de l'arc peut aussi décomposer les vapeurs de trichloroéthylène et de perchloroéthylène pour former du phosgène. NE SOUDEZ PAS ou ne coupez pas dans des endroits où les vapeurs de dissolvants peuvent être attirées dans l'atmosphère de soudage ou de

energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

C. Fire and Explosion Prevention

Causes of fire and explosion are: combustibles reached by the arc, flame, flying sparks, hot slag or heated material; misuse of compressed gases and cylinders; and short circuits.

BE AWARE THAT flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the goggled operator. Sparks and slag can fly 35 feet.

To prevent fires and explosion:

Keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits.

If combustibles are in area, do NOT weld or cut. Move the work if practicable, to an area free of combustibles. Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles at least 35 feet away out of reach of sparks and heat; or protect against ignition with suitable and snug-fitting, fire-resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on (or cut). Walls, ceilings, and floor near work should be protected by heat-resistant covers or shields.

Fire watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if:

a. appreciable combustibles (including building construction) are within 35 feet
b. appreciable combustibles are further than 35 feet but can be ignited by sparks
c. openings (concealed or visible) in floors or walls within 35 feet may expose combustibles to sparks
d. combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

Hot work permit should be obtained before operation to ensure supervisor's approval that adequate precautions have been taken.

After work is done, check that area is free of sparks, glowing embers, and flames.

An empty container that held combustibles, or that can produce flammable or toxic vapors when heated, must never be welded on or cut, unless container has first been cleaned as described in AWS Standard A6.0, listed 7 in Standards index.

This includes: a thorough steam or caustic cleaning (or a solvent or water washing, depending on the com-

coupage et où l'énergie de rayonnement peut pénétrer dans des atmosphères contenant des quantités même minuscules de trichloroéthylène ou de perchloroéthylène.

C. Prévention des incendies et des explosions

Les causes d'incendie et d'explosion sont les combustibles atteints par l'arc, la flamme, les étincelles, le laitier chaud ou les matériaux chauffés, le mauvais emploi des gaz comprimés et des bouteilles ainsi que les courts-circuits.

Sachez que les éclats d'étincelles ou la chute du laitier peuvent s'infiltrer dans les fissures, le long des tuyauteries, par les fenêtres et les portes et par les couvertures des murs ou du sol, sans que le soudeur portant des lunettes ne les voie. Les étincelles et les scories peuvent voler jusqu'à 35 pieds.

Pour prévenir les incendies et les explosions: Veillez à ce que votre appareil soit propre et en état de marche, dénué d'huile et de graisse, et de particules de métal sur les pièces électriques qui pourraient entraîner des courts-circuits.

Si des combustibles se trouvent à proximité, ne soudez pas, ne coupez pas. Si possible, déplacez votre travail loin des combustibles. Évitez les ateliers de peinture au pistolet, les cuves d'immersion, les entrepôts, les ventilateurs. Si cela n'est pas possible, placez les combustibles à au moins 35 pieds des étincelles et de la chaleur et protégez-les des étincelles avec des couvertures ou des écrans protecteurs adéquats, bien ajustés et ignifugés.

On ne doit pas souder (ou couper) le côté opposé des murs touchant les combustibles. Les murs, plafonds et planchers proches du travail doivent être protégés par des couvertures ou écrans protecteurs ignifugés.

Un surveillant doit se tenir à proximité avec un matériel de lutte contre l'incendie adéquat, pendant et quelque temps après le soudage ou le coupage si:

a. Des quantités appréciables de combustibles (y compris une construction en chantier) se trouvent à moins de 35 pieds.
b. Des quantités appréciables de combustibles sont à plus de 35 pieds mais peuvent être enflammées par des étincelles.
c. Des ouvertures (cachées ou visibles) sur les planchers ou les murs à moins de 35 pieds peuvent exposer des combustibles aux étincelles.
d. Les combustibles adjacents aux murs, plafonds, toits ou cloisons métalliques peuvent être enflammés par une chaleur rayonnante ou transmise.

Avant de commencer, avisez le contremaître pour qu'il s'assure que les précautions adéquates soient prises.

Une fois le travail terminé, vérifiez qu'il n'y ait pas d'étincelles, de cendres ardentes ou de flammes dans le local.

On ne doit jamais souder ni couper sur un récipient ayant contenu des combustibles, ou pouvant produire des vapeurs inflammables ou toxiques à la chauffe, à moins que le récipient n'ait été lavé au préalable, comme décrit dans la Norme AWS A6.0, figurant au paragraphe 7 de l'Index des Normes.

Cela comprend: un nettoyage à fond à la vapeur ou au caustique (ou un lavage avec dissolvant ou eau selon la solubilité du combustible) suivi d'une purge et d'une in-

bustible's solubility) followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment as recommended in A6.0. Waterfilling just below working level may substitute for inerting.

A container with unknown contents should be cleaned (see paragraph above). Do NOT depend on sense of smell or sight to determine if it is safe to weld or cut.

Hollow castings or containers must be vented before welding or cutting. They can explode.

Explosive atmospheres. Never weld or cut where the air may contain flammable dust, gas, or liquid vapors (such as gasoline).

D. Compressed Gas Equipment

Standard precautions. Comply with precautions in this manual, and those detailed in CGA Standard P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, listed 11 in Standards index.

1. Pressure Regulators

Regulator relief valve is designed to protect only the regulator from overpressure; it is not intended to protect any downstream equipment. Provide such protection with one or more relief devices.

Never connect a regulator to a cylinder containing gas other than that for which the regulator was designed.

Remove faulty regulator from service immediately for repair (first close cylinder valve). The following symptoms indicate a faulty regulator:

Leaks - if gas leaks externally.
Excessive Creep - if delivery pressure continues to rise with downstream valve closed.
Faulty Gauge - if gauge pointer does not move off stop pin when pressurized, nor returns to stop pin after pressure release.

Repair. Do NOT attempt repair. Send faulty regulators for repair to manufacturer's designated repair center, where special techniques and tools are used by trained personnel.

2. Cylinders

Cylinders must be handled carefully to prevent leaks and damage to their walls, valves, or safety devices:

Avoid electrical circuit contact with cylinders including third rails, electrical wires, or welding circuits. They can produce short circuit arcs that may lead to a serious accident. (See 1-3C.)

ICC or DOT marking must be on each cylinder. It is an assurance of safety when the cylinder is properly handled.

jection d'azote ou de gaz carbonique, en utilisant un équipement de protection comme recommandé dans l'A6-0. L'atmosphère inerte peut être remplacée par un niveau d'eau arrivant au-dessous du travail à effectuer.

Vous devez laver un récipient dont la nature de contenu est inconnue (voir paragraphe ci-dessus). NE vous fiez PAS à l'odorat ou à la vue pour dire si l'on peut le souder ou le couper en toute sécurité.

Vous devez pratiquer un évent sur les pièces ou récipients creux avant de les souder ou couper: ils peuvent exploser.

Atmosphères explosives: Ne soudez ni ne coupez jamais dans des lieux où l'air peut contenir des poussières, gaz ou vapeurs liquides inflammables (tels que l'essence).

D. Gaz comprimé

Précautions générales: Suivez les précautions de ce manuel, et celles décrites à la Norme CGA P-1 (Précautions de sécurité pour la manipulation de gaz comprimés en bouteilles), paragraphe 11 de l'Index des Normes.

1. Détendeurs de pression

La soupape de sûreté d'un détendeur est destinée à protéger seulement le détendeur de la surpression. Elle n'a pas pour but de protéger les boyaux et le chalumeau: on protège ceux-ci par des soupapes de retenue conçues spécialement pour cette fonction.

Ne montez jamais un détendeur sur une bouteille contenant un gaz différent de celui pour lequel le détendeur a été conçu.

Enlevez immédiatement un détendeur défectueux pour le faire réparer (d'abord, fermez le robinet de la bouteille). Les symptômes suivants dénotent la défectuosité du détendeur:

Fuites - si le gaz fuit extérieurement.
Ascension excessive - si la pression de débit continue à monter, le robinet du chalumeau étant fermé.
Manomètre défectueux - si l'aiguille du manomètre ne s'écarte pas de la goupille de butée lors de la mise en pression, ou ne revient pas sur la goupille après l'échappement de la pression.

Réparation. N'ESSAYEZ PAS de réparer vous-mêmes. Envoyez les détendeurs défectueux à réparer aux ateliers de réparation agréés du fabricant, où des techniques et des outils spéciaux sont utilisés par un personnel formé.

2. Bouteilles

Les bouteilles doivent être manipulées avec soin pour prévenir les fuites ou dégâts à leurs parois, robinets ou systèmes de sûreté. Évitez qu'un circuit électrique soit en contact avec les bouteilles, y compris les rails de contact, les fils électriques ou les circuits de soudage. Cela pourrait créer des arcs courts-circuits pouvant entraîner des accidents graves (Voir 1.3C.).

Chaque bouteille doit porter les inscriptions ICC ou DOT. C'est un gage de sécurité pourvu que la bouteille soit bien manipulée.

Identifying gas content. Use only cylinders with name of gas marked on them; do not rely on color to identify gas content. Notify supplier if unmarked. NEVER DEFACE or alter name, number, or other markings on a cylinder. It is illegal and hazardous.

Empties: Keep valves closed, replace caps securely; mark MT; keep them separate from FULLS and return promptly.

Prohibited use. Never use a cylinder or its contents for other than its intended use, NEVER as a support or roller.

Locate or secure cylinders so they cannot be knocked over.

Passageways and work areas. Keep cylinders clear of areas where they may be struck.

Transporting cylinders. With a crane, use a secure support such as a platform or cradle. Do NOT lift cylinders off the ground by their valves or caps, or by chains, slings, or magnets.

Do NOT expose cylinders to excessive heat, sparks, slag, and flame, etc. that may cause rupture. Do not allow contents to exceed 130°F. Cool with water spray where such exposure exists.

Protect cylinders particularly valves from bumps, falls, falling objects, and weather. Replace caps securely when moving cylinders.

Stuck valve. Do NOT use a hammer or wrench to open a cylinder valve that can not be opened by hand. Notify your supplier.

Mixing gases. Never try to mix any gases in a cylinder.

Never refill any cylinder.

Cylinder fittings should never be modified or exchanged.

3. Hose

Prohibited use. Never use hose other than that designed for the specified gas. A general hose identification rule is: red for fuel gas, green for oxygen, and black for inert gases.

Use ferrules or clamps designed for the hose (not ordinary wire or other substitute) as a binding to connect hoses to fittings.

No copper tubing splices. Use only standard brass fittings to splice hose.

Avoid long runs to prevent kinks and abuse. Suspend hose off ground to keep it from being run over, stepped on, or otherwise damaged.

Coil excess hose to prevent kinks and tangles.

Protect hose from damage by sharp edges, and by sparks, slag, and open flame.

Examine hose regularly for leaks, wear, and loose connections. Immerse pressured hose in water; bubbles indicate leaks.

Identification du gaz: N'utilisez que les bouteilles indiquant la nature du gaz; ne vous fiez pas à la couleur pour reconnaître la nature du gaz. Adressez-vous à votre fournisseur si cela n'est pas indiqué.

N'EFFACEZ ou ne modifiez JAMAIS les noms, numéros ou autres indications sur une bouteille. Cela est illégal et dangereux.

Vides: Maintenez les robinets fermés, replacez bien les chapeaux; inscrivez "Vides"; séparez-les des "Pleines" et retournez-les rapidement.

Emploi interdit: N'utilisez une bouteille ou son contenu que pour ce à quoi elle est destinée, mais JAMAIS comme support ou rouleau.

Placez les bouteilles pour qu'elles ne tombent pas. Lorsqu'un détendeur (et un boyau) est monté sur elles, placez les ou attachez-les debout.

Passages et lieux de travail. Enlevez les bouteilles d'un endroit où l'on pourrait les frapper.

Transport des bouteilles. Avec une grue, utilisez un support fiable tel qu'une plate-forme ou un cadre. NE SOULEVEZ PAS des bouteilles du sol par leur robinet ou chapeau, ou avec des chaînes, élingues ou aimants.

N'EXPOSEZ PAS les bouteilles à une chaleur excessive, aux étincelles, au laitier et aux flammes, etc., pouvant causer leur rupture. Le contenant ne doit jamais dépasser 55°C. Refroidissez en pulvérisant de l'eau si nécessaire.

Protégez les bouteilles et particulièrement les soupapes contre les chocs, les chutes, les chutes d'objets et la température. Remettez bien les chapeaux lorsque vous déplacez les bouteilles.

Robinet coincé. N'UTILISEZ PAS un marteau ou une clé métallique pour ouvrir un robinet de bouteille que l'on ne peut pas ouvrir à la main. Avisez votre fournisseur.

Mélange de gaz. N'essayez jamais de mélanger des gaz dans une bouteille.

Ne rechargez jamais une bouteille. Les éléments de la bouteille ne doivent jamais être modifiés ou remplacés.

3. Boyau

Utilisation interdite. N'utilisez jamais un boyau autre que celui approprié au gaz indiqué. La règle générale d'identification est: rouge pour les gaz combustibles, vert pour l'oxygène, et noir pour les gaz inertes.

Utilisez des bagues ou colliers appropriés au boyau (et non du fil ordinaire ou autre substitution) pour brancher les boyaux à l'appareillage.

N'utilisez pas des raccords en cuivre. N'utilisez que des accessoires standard en laiton pour raccorder un boyau.

Utilisez une petite longueur de boyau. Cela évitera les noeuds et l'usure prématurée. Suspendez le boyau au-dessus du sol pour éviter qu'il ne soit écrasé, piétiné ou endommagé.

Enroulez le surplus de boyau pour éviter les noeuds et emmêlements. Évitez que le boyau ne soit endommagé par des tranchants, étincelles, laitier et flamme nue.

Repair leaky or worn hose by cutting area out and splicing (1-2D3). Do NOT use tape.

4. Proper Connections

Clean cylinder valve outlet of impurities that may clog orifices and damage seats before connecting regulator. Except for hydrogen, crack valve momentarily, pointing outlet away from people and sources of ignition. Wipe with a clean lintless cloth.

Match regulator to cylinder. Before connecting, check that the regulator label and cylinder marking agree, and that the regulator inlet and cylinder outlet match. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

Tighten connections. When assembling threaded connections, clean and smooth seats where necessary. Tighten. If connection leaks, disassemble, clean, and retighten using properly fitting wrench.

Adapters. Use a CGA adapter (available from your supplier) between cylinder and regulator, if one is required. Use two wrenches to tighten adapter marked RIGHT and LEFT HAND threads.

Regulator outlet (or hose) connections may be identified by right hand threads for oxygen and left hand threads (with grooved hex on nut or shank) for fuel gas.

5. Pressurizing Steps:

Drain regulator of residual gas through suitable vent before opening cylinder (or manifold valve) by turning adjusting screw in (clockwise). Draining prevents excessive compression heat at high pressure seat by allowing seat to open on pressurization. Leave adjusting screw engaged slightly on single-stage regulators.

Stand to side of regulator while opening cylinder valve.

Open cylinder valve slowly so that regulator pressure increases slowly. When gauge is pressurized (gauge reaches regulator maximum) leave cylinder valve in following position: For oxygen, and inert gases, open fully to seal stem against possible leak. For fuel gas, open to less than one turn to permit quick emergency shutoff.

Use pressure charts (available from your supplier) for safe and efficient, recommended pressure settings on regulators.

Check for leaks on first pressurization and regularly there-after. Brush with soap solution (capful of Ivory Liquid* or equivalent per gallon of water). Bubbles indicate leak. Clean off soapy water after test; dried soap is combustible.

E. User Responsibilities

Remove leaky or defective equipment from service immediately for repair. See User Responsibility statement in equipment manual.

*Trademark of Proctor & Gamble

Vérifiez régulièrement les fuites, l'usure et les raccordements lâches. Plongez le boyau sous pression dans de l'eau; les bulles indiqueront les fuites.

Réparation. Coupez la partie percée ou usée, et raccordez (1-2D3). N'UTILISEZ JAMAIS de ruban adhésif.

4. Branchements corrects

Avant de brancher le détendeur, nettoyez la sortie du robinet de la bouteille des impuretés qui peuvent obstruer les orifices et endommager les sièges. Sauf pour l'hydrogène, ouvrez momentanément le robinet, en éloignant la sortie des personnes et des sources inflammables. Essuyez avec un tissu propre et non graisseux.

Appareillez le détendeur à la bouteille. Avant de brancher, vérifiez que la marque du détendeur et la description de la bouteille concordent, et que l'orifice d'entrée du détendeur et l'orifice de sortie de la bouteille aillent ensemble. NE BRANCHEZ JAMAIS un détendeur conçu pour un gaz spécial (ou des gaz spéciaux) à une bouteille contenant d'autres gaz.

Serrez les branchements. Lorsque vous assemblez des branchements filetés, nettoyez et polissez les sièges où c'est nécessaire. Serrez. Si les branchements perdent, démontez-les, nettoyez et resserez avec une clef adéquate.

Adaptateurs. Placez, si besoin est, un adaptateur CGA (en vente chez votre fournisseur) entre la bouteille et le détendeur. Avec deux clefs, serrez l'adaptateur fileté À DROITE et À GAUCHE.

On peut reconnaître les branchements de sortie du détendeur (ou boyau) à l'aide du filetage à droite pour l'oxygène et à gauche (identifié par un écrou cannelé) pour les gaz combustibles.

5. Démarches de mise en pression

Purgez le détendeur de résidu de gaz avant d'ouvrir la bouteille (ou le robinet de canalisation) en serrant la vis de réglage (dans le sens des aiguilles d'une montre). Cette opération permet au siège de haute pression de s'ouvrir à la mise en pression, supprimant ainsi toute surchauffe de compression. Maintenez la vis de réglage des détendeurs à simple détente légèrement engagée. Avant d'ouvrir le robinet de la bouteille, assurez-vous que les boyaux sont branchés et que les soupapes aval sont fermées.

Tenez-vous latéralement au détendeur en ouvrant le robinet de la bouteille. Ouvrez-le lentement pour que la pression du détendeur monte progressivement. Lorsque le manomètre est mis sous pression (indique le maximum) le robinet de la bouteille de gaz inerte ou d'oxygène devra être ouvert à fond pour assurer l'étanchéité et celui de la bouteille de gaz combustible ouvert de moins d'un tour pour pouvoir le refermer rapidement en cas d'urgence.

Référez-vous aux tableaux de pression (distribués par votre fournisseur) pour un réglage recommandé de pression sûr et efficace sur les détendeurs. Vérifiez les fuites à la première mise en pression puis régulièrement, brossez avec une solution savonneuse (un bouchon d'Ivory Liquid* ou semblable par gallon d'eau). Les bulles indiquent une fuite. Enlevez l'eau savonneuse après examen; le savon sec est inflammable.

*Marque de Commerce de Proctor & Gamble

F. Leaving Equipment Unattended

Close gas supply at source and drain gas.

G. Rope Staging-Support

Rope staging-support should not be used for welding or cutting operation; rope may burn.

1-3. ARC WELDING - Comply with precautions in 1-1, 1-2, and this section. Arc Welding, properly done, is a safe process, but a careless operator invites trouble. The equipment carries high currents at significant voltages. The arc is very bright and hot. Sparks fly, fumes rise, ultraviolet and infrared energy radiates, weldments are hot, and compressed gases may be used. The wise operator avoids unnecessary risks and protects himself and others from accidents. Precautions are described here and in standards referenced in index.

A. Burn Protection

Comply with precautions in 1-2.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-colored surfaces, and burn the skin and eyes. Skin burns resemble acute sunburn, those from gas-shielded arcs are more severe and painful. DON'T GET BURNED; COMPLY WITH PRECAUTIONS.

1. Protective Clothing

Wear long-sleeve clothing (particularly for gas-shielded arc) in addition to gloves, hat, and shoes (1-2A). As necessary, use additional protective clothing such as leather jacket or sleeves, flame-proof apron, and fire-resistant leggings. Avoid outergarments of untreated cotton.

Bare skin protection. Wear dark, substantial clothing. Button collar to protect chest and neck and button pockets to prevent entry of sparks.

2. Eye and Head Protection

Protect eyes from exposure to arc. NEVER look at an electric arc without protection.

Welding helmet or shield containing a filter plate shade no. 12 or denser must be used when welding. Place over face before striking arc.

Protect filter plate with a clear cover plate.

Cracked or broken helmet or shield should NOT be worn; radiation can pass through to cause burns.

Cracked, broken, or loose filter plates must be replaced IMMEDIATELY. Replace clear cover plate when broken, pitted, or spattered.

E. Responsabilités de l'usager

Ôtez immédiatement les parties percées ou défectueuses. Voir les Responsabilités de l'Usager du manuel de l'appareil.

F. Appareil laissé sans surveillance

Fermez l'alimentation de gaz à la source et purgez.

G. Liens et supports temporaires

Pour vos travaux de soudage ou de coupage, n'utilisez pas de la corde comme soutien, elle est inflammable.

1-3. SOUDAGE À L'ARC - Conformez-vous aux précautions des paragraphes 1.1 et 1.2 de cette section. Le soudage à l'arc bien exécuté est sûr, mais un soudeur négligent est un danger. Le poste de soudage transporte des courants élevés sous de fortes tensions. L'arc est très vif et chaud. Les étincelles volent, les vapeurs montent, l'énergie ultra-violette et infrarouge rayonnent, les soudures sont chaudes, et des gaz comprimés peuvent être utilisés. Le soudeur prudent évite les risques inutiles, se protège et protège autrui contre les accidents. Les précautions sont décrites ici et dans les normes données dans l'Index.

A. Protection contre les brûlures

Conformez-vous aux précautions du paragraphe 1.2. L'arc de soudage est intense et visiblement vif. Son rayonnement peut blesser les yeux, traverser les habits légers, se réfléchir sur les surfaces claires, et brûler la peau et les yeux. Les brûlures de la peau ressemblent à un gros coup de soleil. Celles d'arcs sous gaz protecteur sont plus graves et plus douloureuses. NE VOUS BRÛLEZ PAS - SUIVEZ LES PRÉCAUTIONS.

1. Vêtements de protection

Portez des vêtements à manches longues (surtout pour l'arc en atmosphère inerte) avec gants, masque et chaussures (1.2A.).

Si nécessaire portez en plus une veste ou des manches en cuir, un tablier et des guêtres ignifugés. De préférence ne portez pas de vêtements en coton non traité.

Protection de la peau. Portez des vêtements épais foncés. Boutonnez le col pour protéger la poitrine et le cou, et boutonnez les poches pour prévenir l'infiltration d'étincelles.

2. Protection des yeux et de la tête

Évitez que vos yeux soient exposés à l'arc. NE regardez JAMAIS un arc électrique sans protection.

Lorsque vous soudez, portez un écran ou masque avec verre filtrant teinté N° 12 ou plus foncé. Mettez-le sur le visage avant d'amorcer l'arc.

Protégez le verre filtrant d'un couvre-verre clair. NE PORTEZ PAS un masque fendu ou brisé; le rayonnement peut s'infiltrer et causer des brûlures.

Les verres filtrants fendus, brisés ou lâches doivent être remplacés IMMÉDIATEMENT. Remplacez un couvre-verre brisé, piqué ou taché par des projections.

Flash goggles with side shields MUST be worn under the helmet to give some protection to the eyes should the helmet not be lowered over the face before an arc is struck. Looking at an arc momentarily with unprotected eyes (particularly a high intensity gas-shielded arc) can cause a retinal burn that may leave a permanent dark area in the field of vision.

3. Protection of Nearby Personnel

Enclosed welding area. For production welding, a separate room or enclosed bay is best. In open areas, surround the operation with low-reflective, non-combustible screens or panels. Allow for free air circulation, particularly at floor level.

Viewing the weld. Provide face shields for all persons who will be looking directly at the weld.

Others working in area. See that all persons are wearing flash goggles.

Before starting to weld, make sure that screen flaps or bay doors are closed.

B. Toxic Fume Prevention

Comply with precautions in 1-2B.

Generator engine exhaust must be vented to the outside air. Carbon monoxide can kill.

C. Fire and Explosion Prevention

Comply with precautions in 1-2C.

Equipment's rated capacity. Do not overload arc welding equipment. It may overheat cables and cause a fire.

Loose cable connections may overheat or flash and cause a fire.

Never strike an arc on a cylinder or other pressure vessel. It creates a brittle area that can cause a violent rupture or lead to such a rupture later under rough handling.

D. Compressed Gas Equipment

Comply with precautions in 1-2D.

E. Shock Prevention

Exposed hot conductors or other bare metal in the welding circuit, or in ungrounded, electrically-HOT equipment can fatally shock a person whose body becomes a conductor. DO NOT STAND, SIT, LIE, LEAN ON, OR TOUCH a wet surface when welding, without suitable protection.

Vous devez portez des lunettes à écrans latéraux sous le masque pour protéger les yeux dans le cas où le masque ne serait pas abaissé sur le visage avant l'amorçage de l'arc. Regarder momentanément un arc sans protection (principalement un arc en atmosphère inerte à haute intensité) peut brûler la rétine et laisser un point sombre permanent dans le champ de vision.

3. Protection du personnel à proximité

Local de soudage fermé. Pour le soudage de production, il vaut mieux utiliser une salle séparée ou une baie fermée. Dans les locaux ouverts, entourez les travaux d'écrans ou panneaux peu réfléchissants et ininflammables. Laissez l'air circuler librement, particulièrement au niveau du sol.

Donnez des masques aux personnes qui regarderont directement la soudure.

Autres personnes travaillant sur les lieux. Veillez à ce que toutes les personnes portent les lunettes de protection.

Avant d'attaquer la soudure, assurez-vous que les rebords d'écran ou les portes soient fermés.

B. Prévention des gaz toxiques

Suivez les précautions du paragraphe 1.2B. L'échappement du moteur de la génératrice doit être ventilé à l'air extérieur. L'oxyde de carbone peut tuer.

C. Prévention des incendies et des explosions

Suivez les précautions 1.2C. Puissance nominale de l'appareil. Ne surchargez pas le poste de soudage à l'arc. Cela peut surchauffer les câbles et causer un incendie.

Les branchements lâches de câble peuvent surchauffer ou faire des étincelles et causer un incendie.

N'amorcez jamais un arc sur une bouteille ou autre récipient sous pression. Cela créerait un point de rupture entraînant à plus ou moins longue échéance l'explosion du réservoir.

D. Gaz comprimé

Suivez les précautions 1.2D.

E. Prévention des décharges électriques

Des conducteurs chargés ou métal nu incorporés au circuit de soudage ou à un appareil chargé sans mise à la terre peuvent donner une décharge fatale à la personne dont le corps devient conducteur. NE SOUDEZ PAS DEBOUT, ASSIS, COUCHÉ, PENCHÉ sur une surface humide ni en contact avec une telle surface sans protection appropriée.

To protect against shock:

Keep body and clothing dry. Never work in damp area without adequate insulation against electrical shock. Stay on a dry duckboard, or rubber mat when dampness or sweat can not be avoided. Sweat, sea water, or moisture between body and an electrically HOT part - or grounded metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

1. Grounding the Equipment

When arc welding equipment is grounded according to the National Electrical Code, and the work is grounded according to ANSI Z49.1 "Safety In Welding And Cutting," a voltage may exist between the electrode and any conducting object. Examples of conducting objects include, but are not limited to, buildings, electrical tools, work benches, welding power source cases, workpieces, etc. **Never touch the electrode and any metal object unless the welding power source is off.**

When installing, connect the frames of each unit such as welding power source, control, work table, and water circulator to the building ground. Conductors must be adequate to carry ground currents safely. Equipment made electrically HOT by stray current may shock, possibly fatally. Do NOT GROUND to electrical conduit, or to a pipe carrying ANY gas or a flammable liquid such as oil or fuel.

Three-phase connection. Check phase requirements of equipment before installing. If only 3-phase power is available, connect single-phase equipment to only two wires of the 3-phase line. Do NOT connect the equipment ground lead to the third (live) wire, or the equipment will become electrically HOT - a dangerous condition that can shock, possibly fatally.

Before welding, check ground for continuity. Be sure conductors are touching bare metal of equipment frames at connections.

If a line cord with a ground lead is provided with the equipment for connection to a switchbox, connect the ground lead to the grounded switchbox. If a three-prong plug is added for connection to a grounded mating receptacle, the ground lead must be connected to the ground prong only. If the line cord comes with a three-prong plug, connect to a grounded mating receptacle. Never remove the ground prong from a plug, or use a plug with a broken off ground prong.

2. Electrode Holders

Fully insulated electrode holders should be used. Do NOT use holders with protruding screws.

3. Connectors

Fully insulated lock-type connectors should be used to join welding cable lengths.

Pour vous protéger contre les décharges électriques, maintenez votre corps et vêtements secs. Ne travaillez jamais dans un endroit humide sans isolation adéquate contre les décharges électriques. Lorsque vous ne pouvez éviter l'humidité ou la sueur, placez-vous sur un caillebotis sec ou un tapis en caoutchouc. La sueur, l'eau de mer, ou l'humidité entre le corps et une pièce CHARGÉE, ou une pièce de métal à la masse, réduisent la résistance électrique de la surface du corps, permettant l'entrée de courants dangereux, voire mortels.

1. Mise à la terre de l'appareil

Lorsque l'appareil de soudage à l'arc est mise à la terre suivant la norme National Electrical Code, et la masse est mise à la terre suivant la norme ANSI Z49.1 "Safety in Welding and Cutting," une tension peut exister entre l'électrode et un objet conducteur. Certaines de ces objets sont par exemple (mais pas seulement), des bâtiments, des outils électriques, des établis, des châssis de postes de soudure, des pièces d'ouvrage, etc. **Ne jamais touchez l'électrode ou des objets en métal avant d'avoir mis le poste de soudure à l'arrêt.**

À l'installation, branchez les châssis de chaque élément (source de courant, commande, établi et circuit d'eau) à la terre. Les conducteurs doivent pouvoir conduire les courants telluriques en toute sécurité. L'appareil chargé par les courants vagabonds peut donner une décharge risquant d'être mortelle. NE BRANCHEZ PAS VOTRE PRISE DE TERRE à une conduite électrique, ou à un tuyau de gaz ou de liquide inflammable tel que l'huile ou un combustible.

Connexion triphasée. Avant l'installation vérifiez la phase nécessaire à l'appareil. Si seul le triphasé est disponible, ne branchez l'appareil monophasé qu'à deux des fils de la ligne triphasée. NE BRANCHEZ PAS le conducteur de terre de l'appareil au troisième fil (sous tension), autrement l'appareil serait chargé: condition dangereuse pouvant donner une décharge fatale.

Avant le soudage, vérifiez si la prise de terre est uniforme. En branchant, assurez-vous que les conducteurs touchent le métal nu du châssis de l'appareil.

Lorsqu'un appareil doit être alimenté à partir d'un coffret d'alimentation, le conducteur de terre doit être relié à celui-ci.

Si vous avez en plus une fiche à trois broches pour la terre, ne branchez le conducteur de terre qu'à la broche de terre. Si le cordon d'alimentation a une fiche à trois broches, reliez-le à une prise femelle tripolaire reliée à la terre. N'enlevez jamais la broche de terre d'une fiche ou n'utilisez jamais une fiche dont la broche de terre serait brisée.

2. Pince-électrodes

Utilisez des pince-électrodes bien isolées. N'UTILISEZ PAS des pince-électrodes avec vis saillantes.

3. Connecteurs

Utilisez des connecteurs à verrouillage bien isolés pour assembler de longs câbles.

4. Cables

Frequently inspect cables for wear, cracks and damage. IMMEDIATELY REPLACE those with excessively worn or damaged insulation to avoid possibly - lethal shock from bared cable. Cables with damaged areas may be taped to give resistance equivalent to original cable.

Keep cable dry, free of oil and grease, and protected from hot metal and sparks.

5. Terminals And Other Exposed Parts.

Terminals and other exposed parts of electrical units should have insulating covers secured before operation.

6. Electrode

a. Equipment with output on/off control (contactor)

Welding power sources for use with the gas metal arc welding (GMAW), gas tungsten arc welding (GTAW) and similar processes normally are equipped with devices that permit on-off control of the welding power output. When so equipped the electrode wire becomes electrically HOT when the power source switch is ON and the welding gun switch is closed. Never touch the electrode wire or any conducting object in contact with the electrode circuit unless the welding power source is off.

b. Equipment without output on/off control (no contactor)

Welding power sources used with shielded metal arc welding (SMAW) and similar processes may not be equipped with welding power output on-off control devices. With such equipment the electrode is electrically HOT when the power switch is turned ON. Never touch the electrode unless the welding power source is off.

7. Safety Devices

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out.

Before installation, inspection, or service, of equipment, shut OFF all power and remove line fuses (or lock or red-tag switches) to prevent accidental turning ON of power. Disconnect all cables from welding power source, and pull all 115 volts line-cord plugs.

Do not open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns, or flash from switch arcing.

Leaving equipment unattended. Always shut OFF and disconnect all power to equipment.

Power disconnect switch must be available near the welding power source.

4. Câbles

Vérifiez fréquemment l'usure, les fissures et l'altération des câbles. REMPLACEZ IMMÉDIATEMENT ceux dont l'isolation serait trop usée ou altérée pour prévenir les décharges mortelles provoquées par un câble dénudé. Vous pouvez enrouler les parties endommagées de ruban adhésif en épaisseur suffisante pour donner une résistance de câble neuf. Maintenez les câbles secs, dépourvus d'huile et de graisse et mettez-les à l'abri du métal chaud et des étincelles.

5. Têtes de câbles et autres parties dénudées

Avant la mise en marche, les têtes de câbles et autres parties dénudées d'un appareil électrique doivent être munies de leurs couvrefils isolants.

6. Électrode

a . Appareil équipé d'une commande marche/arrêt (contacteur)

En général, les postes de soudure utilisés pour le soudage à l'arc sous protection gazeuse avec électrode fusible (GMAW), ou avec électrode tungstène (GTAW) et des procès semblables sont équipés d'une commande marche/arrêt de la puissance de sortie. Lorsque l'interrupteur est en position "MARCHE" et l'interrupteur du pistolet est fermé, le fil d'électrode devient chargé. Ne touchez jamais le fil électrode ou tout autre objet conducteur faisant contact avec le circuit d'électrode sans couper le courant au poste de soudure.

b . Appareil non-équipé d'une commande marche/arrêt (sans contacteur)

Les postes de soudure utilisés pour le soudage à l'arc avec électrode enrobée (SMAW) et des procès semblabes peuvent être non-équipés d'une commande marche/arrêt de la puissance de sortie. Lorsque l'interrupteur est en position "MARCHE" l'électrode devient chargé. Ne touchez jamais l'électrode sans couper le courant au poste de soudure.

7. Dispositif de sécurité

Le dispositif de sécurité-verrouillage et coupe-circuit ne doit pas être débranché ou déshunté.

Avant l'installation, l'inspection ou la réparation de l'appareil, mettez l'alimentation sur ARRÊT et enlevez les fusibles généraux (ou verrouillez les interrupteurs) pour éviter une remise en MARCHE accidentelle. Débranchez tous les câbles de la source de courant ainsi que les prises des cordons d'alimentation en 115 volts.

Lors du soudage, n'ouvrez pas le circuit d'alimentation et ne changez pas la polarité. S'il est débranché au cours d'une urgence, faites attention aux brûlures de décharge ou aux jaillissements d'étincelles.

Appareil laissé sans surveillance. Mettez toujours sur ARRÊT et débranchez l'appareil.

F. Protection For Wearers Of Electronic Life Support Devices (Pacemakers)

Magnetic fields from high currents can affect pacemaker operation. Persons wearing electronic life support equipment (pacemaker) should consult with their doctor before going near arc welding, gouging, or spot welding operations.

1-4. STANDARDS BOOKLET INDEX - For more information, refer to the following standards or their latest revisions and comply as applicable:

1. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING obtainable from the American Welding Society, 550 Le Jeune Rd, P.O. Box 351040, Miami, FL 33135.
2. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
3. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the U.S. Government Printing Office, Washington, D.C. 20402.
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY -TOE FOOTWEAR obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES obtainable from the American Welding Society, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135.
8. NFPA Standard 51, OXYGEN - FUEL GAS SYSTEMS FOR WELDING AND CUTTING obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
9. NFPA Standard 70-1978, NATIONAL ELECTRICAL CODE obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

L'interrupteur d'arrêt doit toujours se trouver à proximité de la source de courant.

F. Protection pour toute personne portant des appareils électroniques de sauvetage (appareil pour le règlement de battement de coeur)

Inducteurs de courant élevé peuvent nuire le fonctionnement d'un appareil pour le "règlement de battement de coeur." Toute personne portant un appareil électronique de sauvetage (appareil pour le règlement de battement de coeur), devrait consulter un docteur avant d'approcher toute opération de soudage à l'arc, à la gouge ou à point.

1-4. INDEX DES NORMES - Pour plus de renseignements, référez-vous aux normes de l'ACNOR ou aux normes américaines suivantes:

1. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING distribué par l'American Welding Society, 550 Le Jeune Rd., P.O. Box 351040 Miami, FL 33135
2. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING distribué par le Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402
3. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, distribué par U.S. Department of Labor, Washington D.C. 20210
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION distribué par l'American National Standards Institute, 1430 Broadway, New York, NY 10018
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY - TOE FOOTWEAR distribué par l'addresse donnee en 4.
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES distribué par l'addresse donnee en 4.
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE COMBUSTIBLES distribué par l'addresse donnee en 1.
8. NFPA Standard 51, OXYGEN - FUEL GAS SYSTEMS FOR WELDING AND CUTTING distribué par la National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210
9. NFPA Standard 70-1978, NATIONAL ELECTRICAL CODE distribué par l'addresse donnée en 8
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES distribué par l'addresse donnée en 8

11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS obtainable from the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103.

14. American Welding Society Standard AWSF4.1 "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", obtainable from the American Welding Society, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135.

15. ANSI Standard Z88.2 "Practice for Respiratory Protection" obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS distribué par la Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING distribué par la Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

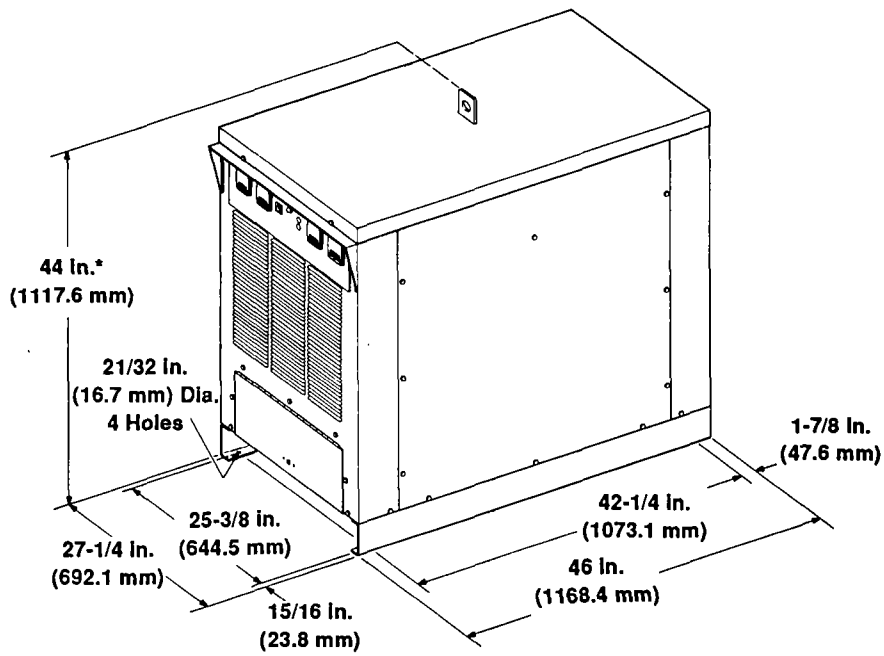
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY distribué par la National Welding Supply Association, 1900 Arch Street Philadelphia, PA 19103.

14. American Welding Societe Standard AWSF4.1 "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", distribué par l'American Welding Societe, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135

15. ANSI Standard Z88.2 "Practice For Respiratory Protection" distribué par l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Table 2-1. Specifications

Model	Rated Welding Output At 100% Duty Cycle	Max. Open-Circuit Voltage	Input At Rated Load Output 60 Hz Three-Phase					Weight	
			Amperes At			kva	kw	Net	Ship
			230V	460V	575V				
1000	1000 Amperes At 76 Volts DC	85	224	112	90	89	85	896 lbs. (406 kg)	986 lbs. (447 kg)
1500	1500 Amperes At 76 Volts DC	85	330	165	132	131	123	1068 lbs. (484 kg)	1158 lbs. (525 kg)



*Dimension Includes 2-7/8 In. (73 mm) Lifting Eye

Figure 2-1. Overall Dimensions And Base Mounting Hole Layout

Chart 2-1. Volt-Ampere Curve

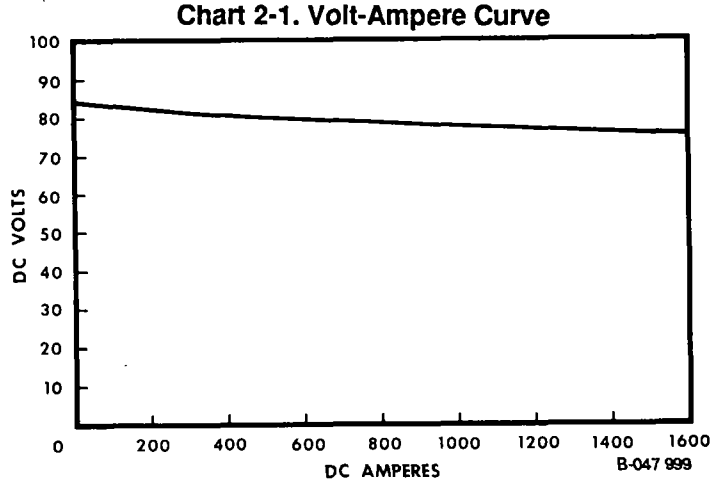
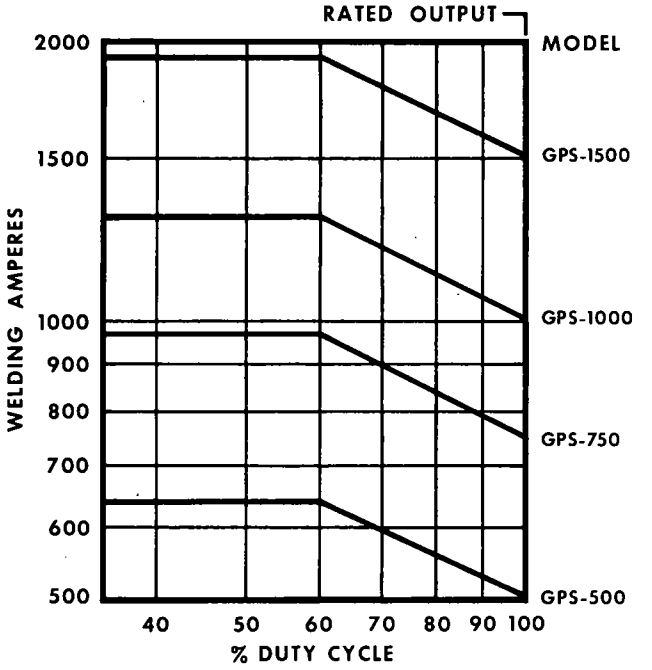


Chart 2-2. Duty Cycle



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2-1. VOLT-AMPERE CURVE (Chart 2-1)

The volt-ampere curve shows the voltage and amperage output capabilities of the welding power source. Refer to the volt-ampere curve (Chart 2-1) to determine the weld amperage at a particular load voltage.

2-2. DUTY CYCLE (Chart 2-2)

The duty cycle is the percentage of a ten minute period that a welding power source can be operated at a given output without overheating and damaging the unit. This welding power source is rated at 100 percent duty cycle; therefore, the unit can be operated at rated load continuously.

Refer to the Duty Cycle Chart (Chart 2-2) to determine the output of the welding power source at various duty cycles.

CAUTION: EXCEEDING DUTY CYCLE RATING will damage unit.

- *Do not exceed indicated duty cycle(s).*

2-3. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertain to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

The nameplate of this unit uses international symbols for labeling the front panel controls. The symbols also appear at the appropriate section in the text.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 - Safety Rules For Operation Of Arc Welding Power Source.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words **WARNING** and **CAUTION** which identify different levels of hazard.

WARNING statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, **IMPORTANT**, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

2-4. RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage **with the delivering carrier.** Assistance for filing or settling claims may be obtained from the distributor and/or the equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide Model Description and Serial Number.

2-5. DESCRIPTION

This unit is a three-phase, dc, dual-polarity welding power source which provides constant voltage (CV) output to Multiple Operator Grids. The unit is primarily used for Shielded Metal Arc Welding (SMAW), Gas Tungsten Arc Welding (GTAW), and Air Carbon Arc Gouging.

GPS power sources have a maximum open-circuit voltage (ocv) of 85 volts. They supply rated output at 76 volts full load and provide 150% of rated output for two minutes after operating at full rated load. These power sources can be paralleled to supply welding current when needed for large quantities of grids.

IMPORTANT: *A Field Installation Kit may be necessary when paralleling GPS-1500 models manufactured before 1981. Contact the manufacturer before paralleling these units.*

SECTION 3 – UNIT INSTALLATION AND RELOCATION

3-1. LOCATION

WARNING: FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- *Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other heavy accessories.*
- *Use equipment of adequate capacity to lift the unit.*
- *If using lift forks to handle this unit, be sure the lift forks are long enough to extend out of the opposite side of the base.*

Using lift forks too short will expose internal components to damage should the tips of the lift forks penetrate the bottom of the unit.

RESTRICTED AIRFLOW causes overheating and possible damage to internal parts.

- *Maintain at least 18 inches (457 mm) of unrestricted space on all sides of unit, and keep underside free of obstructions.*
- *Do not place any filtering device over the intake air passages of this welding power source.*

Warranty is void if any type of filtering device is used.

This welding power source has a lifting eye for lifting or moving the unit, and the base contains prepunched mounting holes. (See Figure 2-1 for base mounting hole layout.) The unit has space underneath it if lift forks are to be used for moving it.

The location should allow room to remove the top cover and side panels for installation, maintenance, and repair procedures.

The service life and efficiency of this unit are reduced when it is subjected to high levels of dust, dirt, moisture, corrosive vapors, and extreme heat.

3-2. WELD OUTPUT CONNECTIONS

RATED OUTPUT

To obtain full rated output from this unit, select, prepare, and install proper weld cables. If any of these areas are neglected, the welding performance of the unit may be affected.

A. Weld Cable Selection

1. Keep cables as short as possible, and place cables close together. Excessive cable length adds resistance which may reduce output or cause the unit to overload.

Table 3-1. Weld Cable Size

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding*							
	50 ft. Or Less (15 m)	100 ft. (30 m)	150 ft. (45 m)	200 ft. (60 m)	250 ft. (70 m)	300 ft. (90 m)	350 ft. (105 m)	400 ft. (120 m)
	10 Thru 100% Duty Cycle							
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	2	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1/0	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	2/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	2/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	4/0	4/0	4/0	2-2/0	2-3/0	2-4/0	1000	1000
600	4/0	4/0	2-2/0	2-3/0	2-4/0	1000	1000	2-750
700	4/0	2-2/0	2-3/0	2-4/0	1000	1000	2-750	2-750
800	2-2/0	2-2/0	2-3/0	2-4/0	1000	2-750	2-750	2-1000
900	2-3/0	2-3/0	2-4/0	1000	1000	2-750	2-1000	2-1000
1000	2-3/0	2-3/0	2-4/0	1000	2-750	2-750	2-1000	2-1000
1250	2-4/0	2-4/0	750	2-750	2-750	2-1000	2-1000	
1500	500	750	1000	2-750	2-1000	2-1000		
1750	750	1000	2-750	2-1000	2-1000			

*Weld cable size (AWG and MCM) is based on either a 4 volts or less drop or a current density of more than 300 circular mils per ampere.

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2. Use weld cables with an insulation voltage rating equal to or greater than the maximum open-circuit voltage (ocv) of the welding power source (see Table 2-1).

C. Weld Cable Connections (Figure 3-1)

These welding power sources have two positive weld output terminals (Positive A and Positive B) and two negative output terminals (Negative A and Negative B). The weld output terminals are located behind the access door on the lower portion of the front panel.

To make weld cable connections, proceed as follows:

WARNING: ELECTRIC SHOCK can kill; TWO TIMES NORMAL OUTPUT VOLTAGE can result from certain connections.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before inspecting or installing.*

  Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

- *Connect weld cables only to matching output terminals (Positive A and Negative A or Positive B and Negative B) unless bus bars are installed.*

  If the Positive A output terminal is connected to the Negative B output terminal and the bus bars are not installed, twice the normal output voltage will be present between terminals Negative A and Positive B. The same is true if Negative A output terminal is connected to Positive B output terminal – twice the normal output voltage will be present between Positive A and Negative B.

- *Do not connect weld terminals together if bus bars are installed.*

  If bus bars are not removed and output terminals are connected together, the unit is short-circuited.

- *Consult all applicable safety codes before installing weld cables.*

IMPORTANT: *Make weld cable connections for the welding polarity required – electrode negative/straight polarity (DCSP) or electrode positive/reverse polarity (DCRP).*

1. 1000 Ampere Models

If the output terminals are bused together (see Figure 3-1), 1000 amperes of weld current is available between the positive and negative output terminals.

If weld output terminals are not bused together, 500 amperes of weld current is available between Positive A and Negative A terminals, and 500 amperes of current is available between Positive B and Negative B terminals.

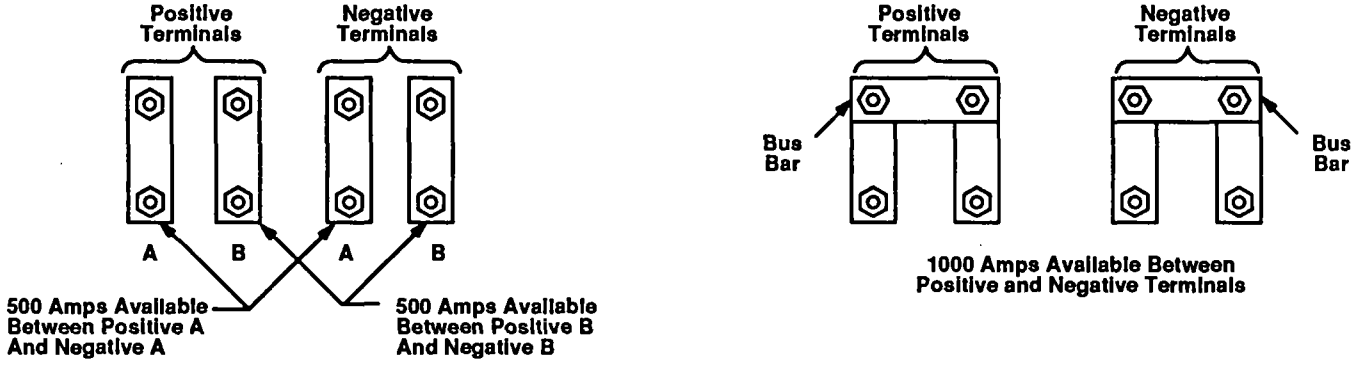
IMPORTANT: *These welding power sources are shipped with bus bars installed (see Figure 3-1).*

2. 1500 Ampere Models

If the output terminals are bused together (see Figure 3-1), 1500 amperes of weld current is available between the positive and negative output terminals.

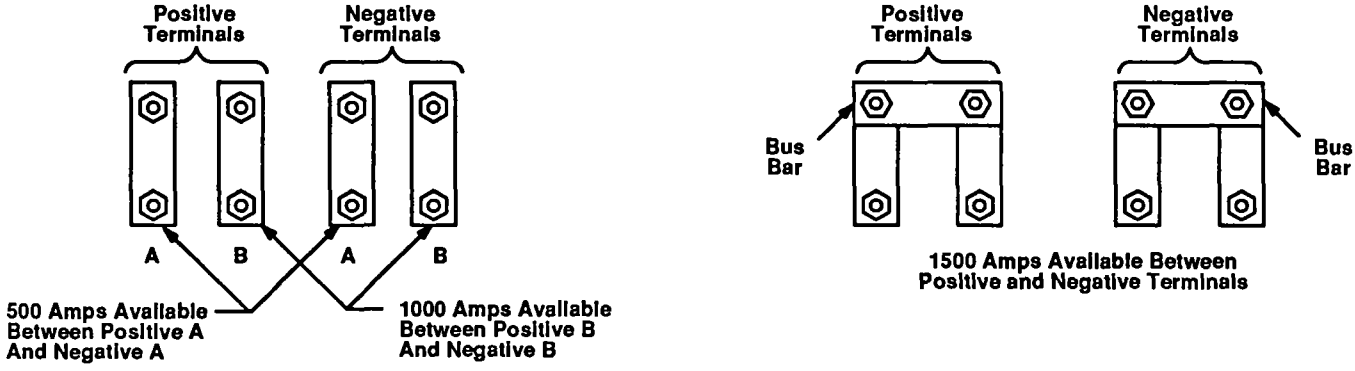
If weld output terminals are not bused together, 500 amperes of weld current is available between Positive A and Negative A terminals, and 1000 amperes of current is available between Positive B and Negative B terminals.

IMPORTANT: *These welding power sources are shipped with bus bars installed (see Figure 3-1).*



IMPORTANT: *1000 Amps and twice the normal output voltage arc available between Positive A and Negative B OR between Negative A and Positive B terminals if bus bars not installed.*

1000 AMPERE MODELS



IMPORTANT: *1500 Amps and twice the normal output voltage arc available between Positive A and Negative B OR between Negative A and Positive B terminals if bus bars not installed.*

1500 AMPERE MODELS

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Figure 3-1. Weld Output Connections

3-3. ELECTRICAL INPUT CONNECTIONS (Figure 3-2 And Figure 3-3)

INPUT

A. Electrical Input Requirements

Operate the welding power source from a three-phase, 60 Hz, ac power supply. The input voltage must match one of the electrical input voltages shown on the input data label on the unit nameplate. Contact the local electric utility for information about the type of electrical service available and how proper connections should be made.

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before inspecting or installing.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

B. Jumper Link Placement (Multi-Voltage Models Only) (Figure 3-2)

IMPORTANT: *Single-voltage models (except GPS-1500V models) are wired directly to the contactor – they do not have an input terminal board.*

IMPORTANT: *All directions, such as left or right, are with respect to the operator facing the unit front panel.*

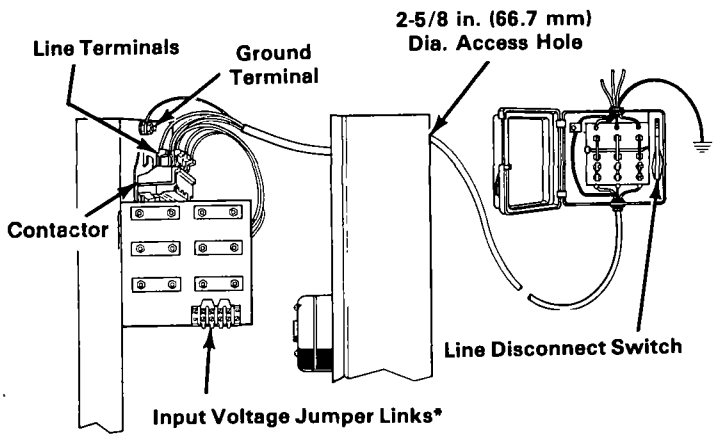
These units are equipped with input voltage jumper links installed onto the input terminal board. The position of the jumper links determines at which line voltage the welding power source will operate. Both models, 1000 Ampere and 1500 Ampere, are shipped with links positioned for the highest voltage stated on the nameplate. If the unit is to be operated from a lower input voltage, remove right side panel and reposition jumper links to match the available line voltage (see input voltage label on or near input terminal board). Proceed as follows:

1. Remove right side panel.
2. Compare position of jumper links on the input terminal board to the voltage link arrangement shown on input voltage label.

CAUTION: INCORRECT INPUT VOLTAGE JUMPER LINK PLACEMENT can damage unit.

- *Position jumper links as shown on the input voltage label located on the input terminal board or the center upright inside the welding power source.*
- *Store unused jumper links across linked terminals.*

3. Reinstall jumper links onto the input terminal board to match the available input line voltage.
4. Reinstall right side panel.



*1000 Model Illustrated

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Figure 3-2. Location For Input Conductor Connections (1000 Ampere Model Shown)

C. Jumper Link Placement For Input Voltage Compensation (GPS-1500V Models Only) (Figure 3-3)

These power sources are able to compensate for high or low incoming line voltage. The level of compensation is determined by jumper link placement on the input terminal board. The input terminal board has three terminals which represent three levels of voltage compensation: +5%, 0%, and -5%. Position jumper links as follows:

IMPORTANT: *The unit is shipped with the jumper links positioned for 0% (zero) compensation; therefore, if the incoming line voltage is relatively close to the input requirement, do not change jumper link position.*

1. If the incoming line voltage is high, position jumper links for +5% compensation.
2. If the line voltage is low, position jumper links for -5% compensation.

IMPORTANT: *All three jumper links must be positioned for the same percentage of compensation (see Figure 3-3).*

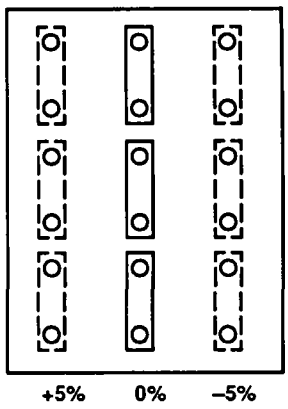

Figure 3-3. Jumper Link Position For Voltage Compensation (GPS-1500V Models Only)

D. Input Conductor Connections (Figure 3-2)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Install a fusible line disconnect switch in the input circuit to the welding power source.*

The input circuit switch provides a safe and convenient means to completely remove all electrical power from the welding power source whenever it is necessary to inspect or service the unit.

- *Employ lockout/tagging procedures on input line before making input connections to the welding power source.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

- *Connect input conductors to the welding power source before connecting to three-phase input power.*

Table 3-2. Input Conductor And Fuse Size

Model	Input Voltage	Input Conductor Size (AWG)	Ground Conductor Size (AWG)	Fuse Size In Amperes
1000 Ampere	230V	4/0	3	350
	460V	2	6	175
	575V	2	6	125
1500 Ampere	230V	400MCM	2	500
	460V	2/0	4	250
	575V	1/0	4	225

*Conductor size is based on National Electrical Code (NEC) specifications for allowable ampacities of insulated copper conductors, having a temperature rating of 167°F (75°C), with not more than three single current-carrying conductors in a raceway (Article 310 of NEC). (The ground conductor is not counted as a current-carrying conductor.)

*Fuse size is based on not more than 200 percent of the rated input amperage of the welding power source (Article 630 of NEC).

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1. Using Table 3-2 as a guide, select and obtain line fuses for the disconnect switch.
2. Using Table 3-2 as a guide, select input conductors for the installation. The input conductors should be covered with an insulating material that complies with national, state, and local electrical codes.
3. Install terminal lugs of adequate amperage capacity and correct stud size onto input and ground conductors.
4. Remove left side panel.

WARNING: ELECTRIC SHOCK can kill.

- *Do not connect an input conductor to the ground terminal in the unit.*
- *Do not connect the ground conductor to an input line terminal.*

Incorrect input connections can result in an electrically energized welding power source chassis. The ground terminal is connected to the welding power source chassis and is for grounding purposes only.

5. Obtain and install a standard conduit strain relief into the rear panel access hole.
6. Insert the conductors through the strain relief installed in Step 5. Route conductors to the input terminal board.
7. Connect the input conductors to the line terminals on the contactor.
8. Connect the ground conductor to the ground terminal located on the frame of the welding power source near the contactor.
9. Connect the remaining end of the ground conductor to a suitable ground. Use a grounding method that complies with applicable electrical codes.
10. Connect remaining ends of input conductor to a deenergized line disconnect switch.
11. Secure the input cable in the strain relief.
12. Reinstall left side panel.

SECTION 4 – OPERATOR CONTROLS

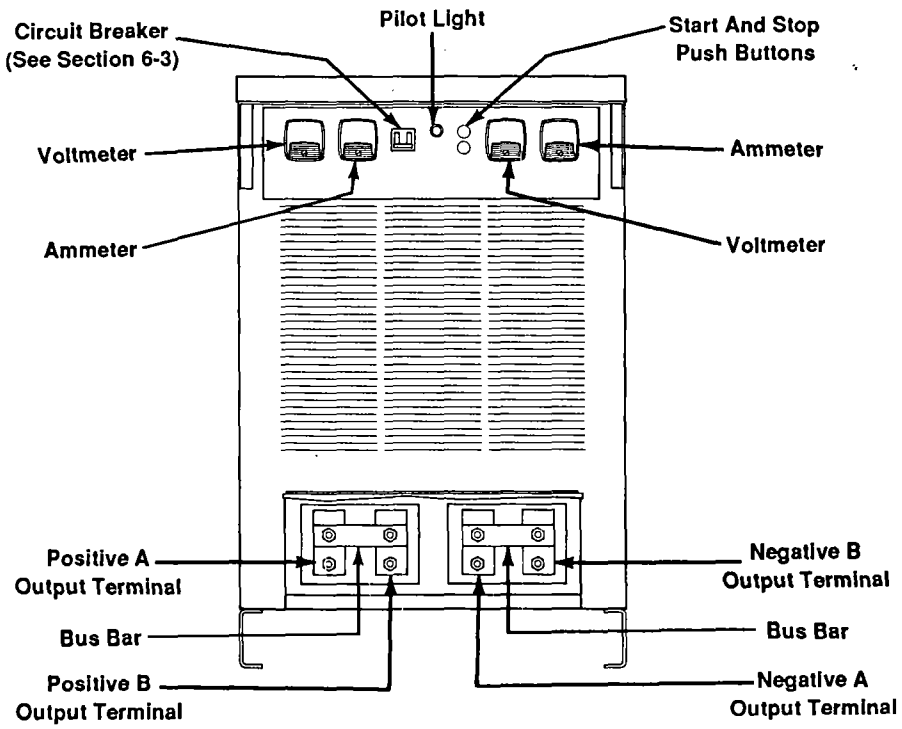

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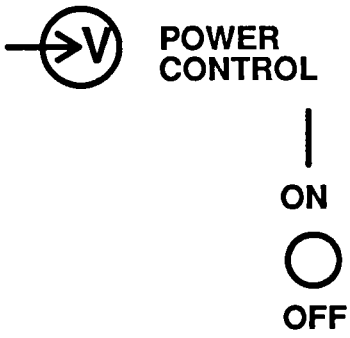
Figure 4-1. Operator Controls

4-1. START AND STOP PUSH-BUTTON SWITCH (Figure 4-1)



Depressing the Start push button energizes the welding power source, placing it in a ready-to-weld status. Depressing the Stop push button shuts down the unit.

4-2. PILOT LIGHT (Figure 4-1)

The pilot light comes on when the Start button is depressed, indicating that the unit is energized.

4-3. METERS (Figure 4-1)

The meters are provided to monitor the welding operation; however, they are not intended for exact current or voltage measurements. The meters are internally connected to the output circuit. The voltmeters indicate the voltage at the weld output terminals, but not necessarily the actual voltage at the welding arc (due to cable resistance, possible poor connections, etc.). The ammeters indicate the current output of the unit.

SECTION 5 – SEQUENCE OF OPERATION

WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury; IMPROPER AIRFLOW AND EXPOSURE TO ENVIRONMENT can damage internal parts.

- *Do not touch live electrical parts.*
- *Keep all covers and panels in place while operating.*

Warranty is void if the welding power source is operated with any portion of the outer enclosure removed.

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Keep your head out of the fumes.*
- *Ventilate to keep from breathing fumes and gases.*
- *If ventilation is inadequate, use approved breathing device.*

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- *Watch for fire.*
- *Keep a fire extinguisher nearby, and know how to use it.*
- *Do not use near flammable material.*
- *Allow work and equipment to cool before handling.*

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- *Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.*

See Section 1 - Safety Rules For Operation Of Arc Welding Power Source for basic welding safety information.

5-1. UNIT PREPARATION FOR OPERATION

1. Install and connect welding power source as instructed in Section 3.
2. Install and connect auxiliary equipment according to its Owner's Manual.
3. Energize welding power source and auxiliary equipment.
4. Begin operation.

5-2. SHUTTING DOWN

1. Stop welding.
2. Deenergize all auxiliary equipment, and depress the STOP push button on the welding power source.
3. Turn off the shielding gas supply, if applicable.

WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- *Shut off gas supply when not in use.*

SECTION 6 – MAINTENANCE & TROUBLESHOOTING

6-1. ROUTINE MAINTENANCE

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- *Keep away from moving parts.*

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

Troubleshooting to be performed only by qualified persons.

Table 6-1. Maintenance Schedule

FREQUENCY	MAINTENANCE
Every Month	Units in heavy service environment: Check weld cables and labels; clean internal parts (see Section 6-1B).
Every 3 Months	Check weld cables (see Section 6-1A).
Every 6 Months	Check all labels (see IMPORTANT at beginning of Section 6-1).
Yearly	Clean internal parts (see Section 6-1B).

IMPORTANT: *Every six months inspect the labels on this unit for legibility. All precautionary labels must be maintained in a clearly readable state and replaced when necessary. See Parts List for part number of precautionary labels.*

A. Weld Cables

Every three months inspect cables for breaks in insulation. Repair or replace cables if insulation breaks are present. Clean and tighten connections at each inspection.

B. Internal Cleaning

Every year blow out or vacuum dust and dirt from the internal components of the welding power source. Remove the outer enclosure from the unit, and use a clean, dry airstream or vacuum suction for the cleaning operation. If dirty or dusty conditions are present, clean the unit more frequently.

6-2. FAN MOTOR

These units are equipped with an exhaust fan and relies on forced draft for adequate cooling. The fan motor is manufactured with lifetime sealed bearings and requires no maintenance.

6-3. OVERLOAD PROTECTION

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

A. Fuse F1

WARNING: Read and follow safety information at beginning of entire Section 6 before proceeding.

Fuse F1 is a cartridge-type fuse which protects the unit from damage due to an internal short or excessive overload in control transformer T2. If F1 opens, the unit becomes completely inoperative. If F1 opens, locate and correct the problem, and replace F1 as follows. If F1 opens repeatedly, contact the nearest Factory Authorized Service Station.

1. Remove left side panel.
2. Locate fuse F1 on center panel (see Parts List Figure B), and remove F1.
3. Install new fuse F1, and reinstall left side panel.

CAUTION: IMPROPER FUSES can damage this unit.

- *If replacement becomes necessary, use only fuses of the proper size, type, and rating (see Parts List).*

B. Circuit Breaker CB (Figure 4-1)

OVERLOAD

WARNING: Read and follow safety information at beginning of entire Section 6 before proceeding.

Circuit breaker CB protects the unit if the secondary winding of main transformer T1 is drawing an excessive amount of current. Current transformers CT1 and CT2 sense the current in the secondary of T1. If CT1 and CT2 sense that the secondary is drawing too much current,

circuit breaker CB opens, the contactor is deenergized, and the unit shuts down. Locate and correct the problem, and manually reset the circuit breaker.

6-4. THERMAL PROTECTION (THERMOSTAT TP1)

Thermostat TP1, located in the main transformer T1, is wired into the contactor W circuit. If the unit overheats, TP1 opens, contactor W is dropped from the circuit, and the unit shuts down. If TP1 opens, let unit cool before resuming operation.

6-5. TROUBLESHOOTING

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- *Keep away from moving parts.*

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

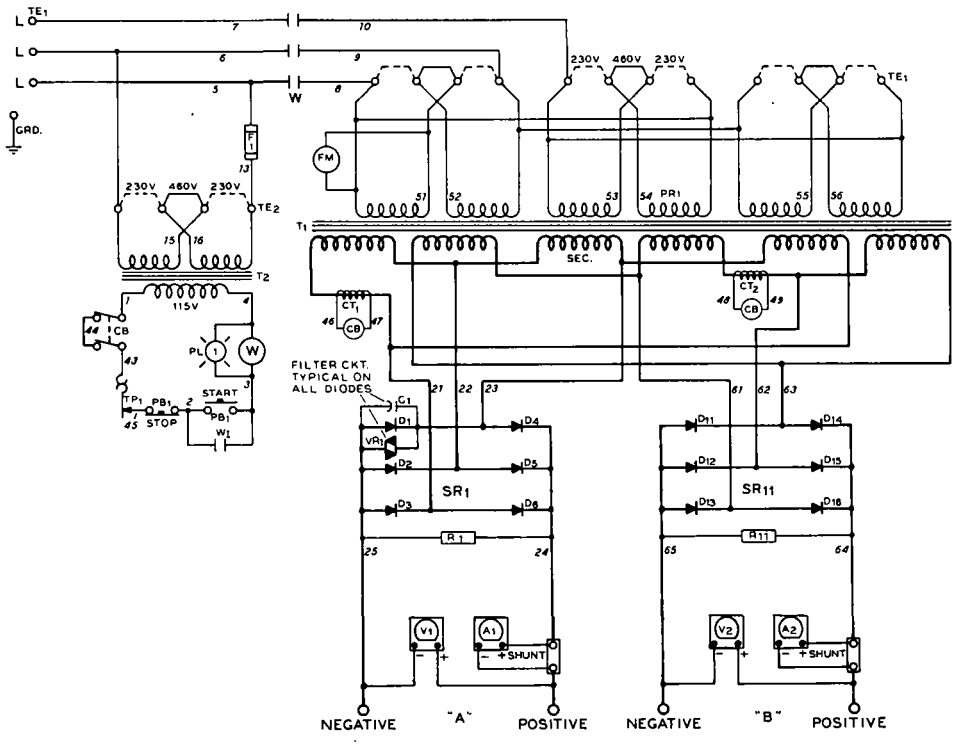
Troubleshooting to be performed only by qualified persons.

The following chart is designed to diagnose and provide remedies for some of the troubles that may develop in these welding power sources.

Use this chart in conjunction with the circuit diagram while performing troubleshooting procedures. If the trouble is not remedied after performing these procedures, contact the nearest Factory Authorized Service Station. In all cases of equipment malfunction, strictly follow the manufacturer's procedures and instructions.

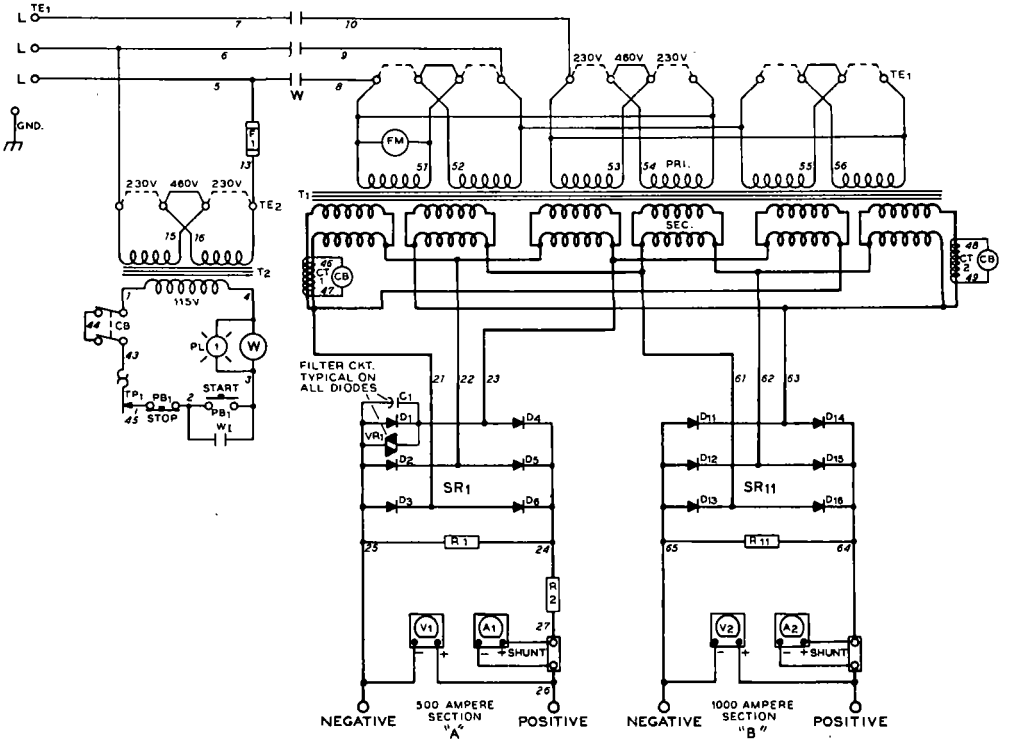
Chart 6-1. Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
No output.	Line disconnect switch in OFF position.	Place line disconnect switch in ON position.
	Line fuses.	Check and replace line fuses, if necessary.
	Fuse F1.	Replace F1 (see Section 6-3).
	Circuit breaker C.	Reset CB (see Section 6-3).
		Replace CB.
	Thermostat TP1.	Let unit cool before operating (see Section 6-4).
		Replace TP1.
	Input voltage jumper links not in proper position on primary terminal board TE1.	See Section 3-3 for proper jumper link position.
	Improper electrical input connections.	See Section 3-3 for proper input connections.
	Start and Stop push-button switch PB1.	Be sure that Start push button has been depressed.
	Input voltage jumper links not in proper position.	See Section 3-3 for proper jumper link position.
No weld output; fan operative.	Improper connections to weld output terminals.	See Section 3-2 for proper weld output connections.
Low or high output.	Input voltage jumper links not in proper position.	See Section 3-3 for proper jumper link position.
Erratic weld output.	Loose or dirty weld cable connections.	Clean and tighten all weld cable connections.
Fan motor FM inoperative and/or overheating.	Fan blade obstruction.	Remove obstruction and check fan blade. Replace FM, if necessary.
	Fan motor FM.	Check and replace FM, if necessary.



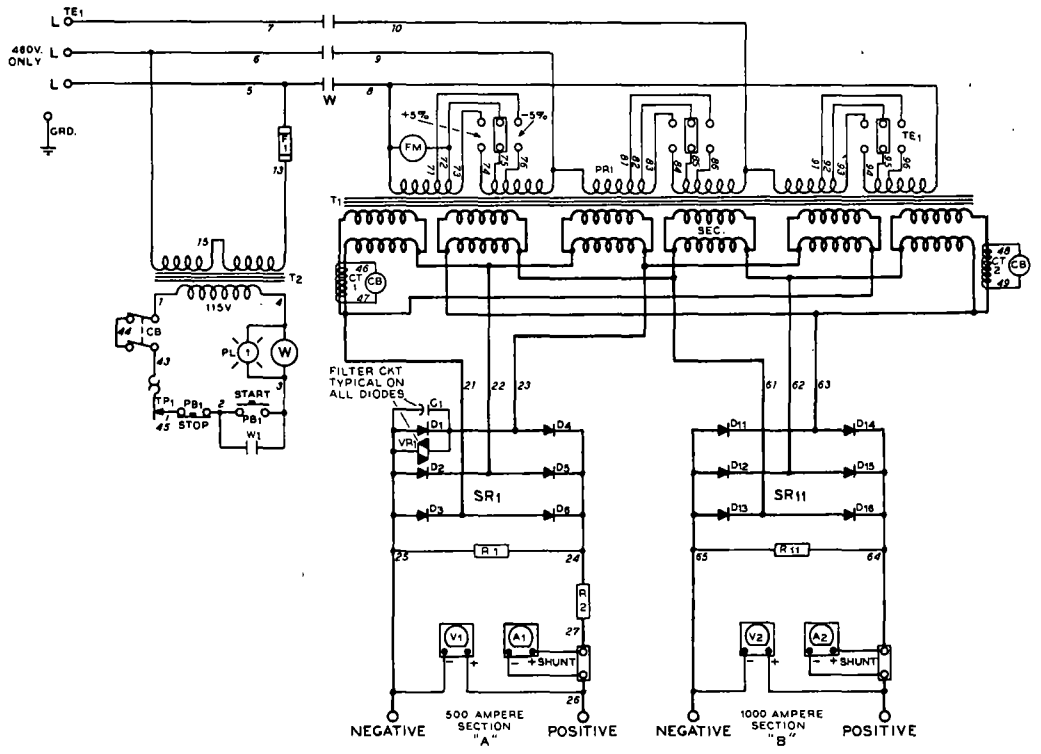
Circuit Diagram No. B-086 792

Diagram 7-1. Circuit Diagram For GPS-1000 Models



Circuit Diagram No. B-088 038-A

Diagram 7-2. Circuit Diagram For GPS-1500A Models



Circuit Diagram No. B-008 039-A

Diagram 7-3. Circuit Diagram For GPS-1500V Models

SECTION 8 – PARTS LIST

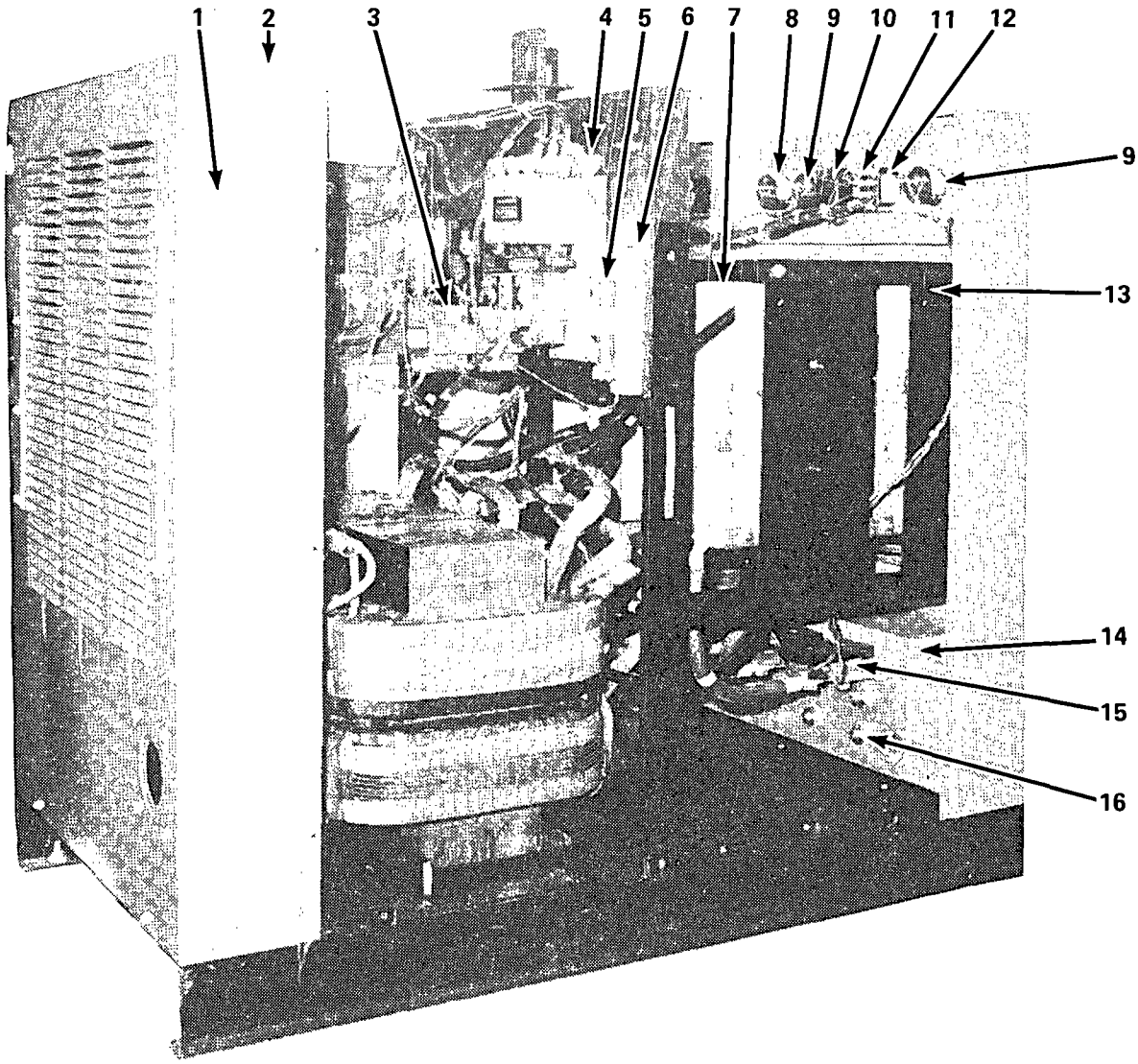


Figure 8-1 – Left Side View

Replace Coils at Factory or Factory Authorized Service Station

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model		
Figure 8-1			**Left Side View**	1000	1500A	1500V
1		120 496	PLATE, adapter-power cord	1	1	1
2		070 558	PANEL, rear	1	1	1
3	T2	036 630	TRANSFORMER, control (230/460)	1	1	1
3	T2	092 773	TRANSFORMER, 1/2 KVA (460/575)	1	1	
4	W	099 044	CONTACTOR, 3P 110-120/220-240 (consisting of)	1		1
4	W	004 104	CONTACTOR, 3P 210 amp 600 volts (consisting of)		1	
		048 599	· COIL	1		1
		004 259	· COIL		1	
		*004 258	· KIT, point-contact		1	
	W1	048 731	INTERLOCK, contactor - NO	1		1
	W1	034 821	INTERLOCK, contactor - NO		1	
5	F1	*088 384	FUSE, cartridge 1 amp 600 volts (230/460)	1	1	1
5	F1	*012 639	FUSE, cartridge 6 amp 600 volts (460/575)	1	1	
6		070 404	HOLDER, fuse	1	1	1
7	SR1,11	079 827	RECTIFIER, silicon diode (consisting of)	2		
7	SR1	079 827	RECTIFIER, silicon diode (consisting of)		1	1
		037 157	· DIODE, 275 amp 250 volts SP	12	12	12
		031 689	· CAPACITOR, ceramic 0.01 uf 500 volts	6	6	6
	R1	085 294	· RESISTOR, WW fixed 5 watt 2K ohm	1	1	1
	VR1	035 645	· VARISTOR, 8 joule 150 volts	6	6	6
7	SR11	045 586	RECTIFIER, silicon diode (consisting of)		1	1
		031 689	· CAPACITOR, ceramic 0.01 uf 500 volts		6	6
		037 156	· DIODE, 275 amp 250 volts		18	18
	R11	085 295	· RESISTOR, WW fixed 5 watt 2K ohm		1	1
	VR1	035 645	· VARISTOR, 8 joule 150 volts		6	6
8	V1,2	025 638	METER, volts dc 0-100 scale	2	2	2
9	A1,2	059 118	METER, amp dc 50 MV 0-800 scale	2		
9	A1	059 118	METER, amp dc 50 MV 0-800 scale		1	1
9	A2	044 104	METER, amp dc 50 MV 0-1.5K scale		1	1
10	PB1	011 636	SWITCH, push button - start - stop 60 amp 110 volts	1	1	1
11	PL1	*027 629	BULB, incandescent - slide base 120 volts	1	1	1
		027 631	HOUSING, light - slide base 125 volts	1	1	1
		027 628	LENS, light - red clear	1	1	1
12	CB	034 945	CIRCUIT BREAKER, manual reset 2P 5 amp 240 volts ac	1	1	1
13		059 563	BAFFLE, air - top rectifier	1	1	1
14		059 616	BRACKET, mounting - terminal board	1	1	1
15	Shunt	079 388	SHUNT, meter 50 MV 800 amp	2	1	1
15	Shunt	072 425	SHUNT, meter 50 MV 1500 amp		1	1
16		059 567	TERMINAL, power - output (consisting of)	1	1	1
		601 841	· NUT, brass - hex jam 5/8-11	16	16	16
		601 842	· NUT, brass - hex full 5/8-11	8	8	8
		059 566	· TERMINAL BOARD	2	2	2
		038 909	· STUD, brass 5/8-11 x 3	8	8	8
		602 249	· WASHER, flat - SAE 5/8	8	8	8
		602 219	· WASHER, lock - external tooth 5/8	8	8	8
		038 032	· BUS BAR	4	4	4

*Recommended Spare Parts.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

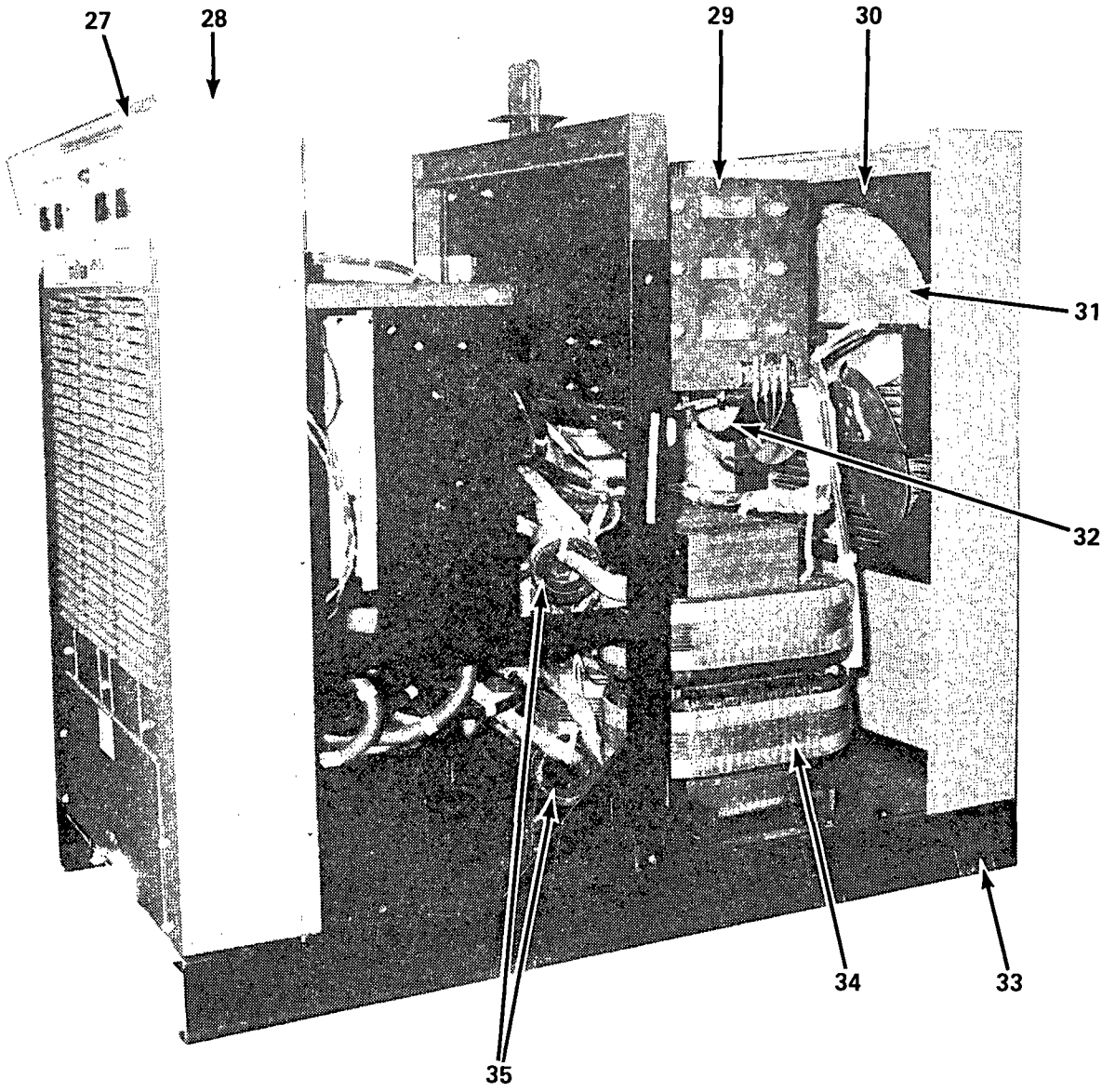


Figure 8-2 - Right Side View

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model		
Figure 8-2			**Left Side View**	1000	1500A	1500V
		105 630	LABEL, electric shock can kill	1	1	1
28		+070 556	PANEL, front	1	1	1
		605 583	CATCH, spring-loaded door	1	1	1
29	TE1	059 555	TERMINAL, pri (230/460) (consisting of)	1	1	
29	TE1	049 957	TERMINAL, pri (460/575) (consisting of)	1	1	
29	TE1	044 098	TERMINAL, pri (consisting of)			1
		038 897	· TERMINAL BOARD, pri	1	1	
		038 980	· TERMINAL BOARD, pri			1
		602 221	· WASHER, lock-internal tooth 3/8	12	9	18
		010 910	· WASHER, flat - SAE 3/8	12	9	18
		*601 838	· NUT, brass-hex 3/8-16	36	24	42
	TE2	038 621	· BLOCK, terminal 30 amp 4 pole	1		
		038 804	· STUD, brass 3/8-16 x 2-1/2	12	9	18
		*038 898	· LINK, terminal-connecting	6	3	3
		*038 620	· LINK, jumper - terminal block 30 amp	2	1	
		038 602	· BLOCK, terminal 30 amp 3 pole (460/575)		1	
	R2	083 640	RESISTOR, grid		1	1
30		059 585	WINDTUNNEL, 20 inch	1		
30		083 637	WINDTUNNEL, 20 inch		1	1
31		032 616	BLADE, fan 60 Hz 20 inch 3 wing 21 deg	1	1	1
32	FM	032 605	MOTOR, 1/4 hp 230 volts ac 1625 rpm	1	1	1
		059 983	BUS BAR, jumper - secondary	2	2	2
33		070 644	BASE	1	1	1
34	T1	092 771	TRANSFORMER (230/460) (consisting of)	1		
34	T1	092 772	TRANSFORMER (460/575) (consisting of)	1		
34	T1	092 786	TRANSFORMER (230/460) (consisting of)		1	
34	T1	092 787	TRANSFORMER (460/575) (consisting of)		1	
34	T1	092 788	TRANSFORMER (460) (consisting of)			1
		092 302	· COIL, pri/sec (230/460)	6		
		092 303	· COIL, pri/sec (460/575)	6		
		092 301	· COIL, pri/sec (230/460)		6	
		092 300	· COIL, pri/sec (460/575)		6	
		092 295	· COIL, pri/sec (460)			6
	TP1	092 624	· THERMOSTAT, NC	6	6	6
35	CT1,2	080 075	TRANSFORMER, current 300/5	2	2	2
		+120 495	PANEL, side	2	2	2
		109 035	LABEL, warning electric shock can kill etc	1	1	1
		+070 555	COVER, top	1	1	1
		123 154	LABEL, general precautionary	1	1	1
		010 014	CLAMP, 3/4 dia x 13/64 mtg hole		2	2
		026 627	GASKET, lifting eye-cover	1	1	1

*Quantities change according to voltage. When ordering use quantities on board in unit.
+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.